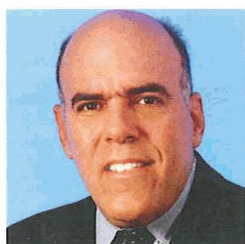


The Knowledge Notebook

The Costs of Knowledge

BY LAURENCE PRUSAK



One of the defining features of society and the economy at the beginning of the twenty-first century is the plummeting cost of working with information. The IT revolution, which started its public life slowly in the mid-1950s, picked up tremendous steam in the decades that followed. By the end of the century, the cost of accruing and distributing information had fallen to levels that would have been inconceivable a few dozen years earlier.

A computer scientist I know recently took his twelve-year-old son to a baseball game. The boy bought a box of candy that contained a little “prize”—a very small, cheaply made calculator. This boy, who lives with pretty sophisticated machinery, disdainfully tossed the toy into the nearest trash can. His father retrieved it and brought it home to look closely at it. He found that this trivial toy had more computing power than the largest machines built during the Second World War! All that change has happened in my own lifetime. The computing power of the mission control center that got Apollo to the moon in the sixties—a hugely expensive marvel at the time—is utterly insignificant today.

The effect of cheap and seemingly ubiquitous computing on the search for and retrieval of information is apparent to all. Less obvious is the fact that knowledge is *not* subject to these changes. In fact, one can make the case that knowledge costs have actually increased over the same period. Let’s look at why information and knowledge are so different in this regard.

Some recent research I conducted with some colleagues divided up the actual activities that working with knowledge entails into four discrete

activities: searching for knowledge, negotiating with knowledge sources, adapting and adopting new knowledge, and distributing knowledge. All these human activities take time and attention. While technology can play a role in mitigating their costs, knowledge still proves to be an expensive item in any organization’s budget.

Searching for knowledge is probably the most amenable to some sort of technological assist. Virtually everyone uses some sort of search engine, often Google, to try to figure out who knows something they need to learn about and how to contact them. While this isn’t a fail-safe process—the Web includes a lot of self-promotion and bogus information—it is a remarkably efficient way to get started.

But acquiring knowledge—genuinely learning something new—requires the consent and commitment of the person you’re trying to learn from. In contrast to information, which can usually be effectively transmitted in a document or diagram, knowledge comes from explaining, clarifying, questioning, and sometimes actually working together. Getting this kind of attention and commitment often involves some form of negotiation, since even the most generous person’s time and energy are limited. Few experts sit around waiting to share their knowledge with strangers or casual acquaintances.

In reasonably collaborative enterprises—I think NASA is one—this sort of negotiation isn’t too onerous. People want to help each other and share what they know, so the “cost” of acquiring knowledge is relatively low. In many organizations (and many communities and countries), however, there are considerable costs

associated with this activity, and many situations in which negotiations fail.

The greatest knowledge cost is in adapting and adopting knowledge to one's own use. Sometimes this means formally organizing what one learns in writing. Sometimes it means just taking time to reflect on someone else's thoughts and experiences—thinking about knowledge that is not exactly what you need but can lead you to develop ideas that will be useful. A long, discursive conversation, with all the back-and-forth that defines conversation, can be a mechanism of knowledge exchange. I have seen many participants at NASA APPEL Masters Forums talking, reflecting, and thinking—adapting what they are hearing to their own needs.

Knowledge transfer is not a simple proposition. An enormous amount of information flows through the world every day, but knowledge is local, contextual, and “sticky”—that is, it takes real effort to move it from one place to another. There is no way around this. To really learn a subject, you have to work at it, you have to pay your “knowledge dues.” So while, thanks to advances in technology, almost infinite amounts of information are instantly available, it still takes the same amount of time and work to learn French as it did in the year 1800—or to master physics or philosophy.

The computer on your desk is amazing. So is the Internet. They make a lot of things easier. (I wrote this little article on my computer and e-mailed it to *ASK*'s managing editor. Twenty-five years ago, I would have had to type it, put it in the mail, and wait for handwritten revisions, which would have required retyping and re-mailing the whole thing.) New technologies put a wealth of information at your fingertips. But don't mistake that information for knowledge. Information can fly through cyberspace, but knowledge resides in people, practices, and work routines. Information is fast and cheap. Knowledge costs time and effort. ●

IN CONTRAST TO INFORMATION,
WHICH CAN USUALLY BE EFFECTIVELY
TRANSMITTED IN A DOCUMENT OR
DIAGRAM, KNOWLEDGE COMES FROM
EXPLAINING, CLARIFYING, QUESTIONING,
AND SOMETIMES ACTUALLY WORKING
TOGETHER.